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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/582,558	06/29/2000	HIROAKI SUDO	JEL-31206	2761

7590 09/23/2005

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EXAMINER	
ODOM, CURTIS B	
ART UNIT	**PAPER NUMBER**
2634	

DATE MAILED: 09/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/582,558	SUDO ET AL.	
	Examiner	Art Unit	
	Curtis B. Odom	2634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 September 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *19-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *19-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 June 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 7/21/2005 have been fully considered but they are not persuasive. Applicant states that Bussgang et al. (previously cited in Office Action 3/29/2005) does not teach or suggest "inputting of first and second information sequences each comprising a sequence of a plurality of bits in series". However, it is the understanding of the examiner that Bussgang et al. does in fact disclose suggest "inputting of first and second information sequences each comprising a sequence of a plurality of bits in series". With regards to Fig. 1, successive samples are input to A/D Converter (element 10) and output to a parallel to series converter (element 12). Each sample in digitized and output from the parallel to series converter as an 8-bit PCM word ($X_{01}, X_{11}, X_{21}, X_{31}, X_{41}, X_{51}, X_{61}, X_{71}$). However, Bussgang et al. discloses successive samples are received and digitized over time (column 3, line 28-column 4, line 3). Therefore, over time, each output of the parallel to series converter would include a sequence of a plurality of successive bits in series (see column 7, lines 3-35). For example, as each sample is received and digitized over time, the first output of the of the parallel to series converter input to the first input of bit select (element 13) would be $X_{01}, X_{02}, X_{03}, X_{04}$, etc...(wherein this a plurality of bits in series (see column 7, lines 3-35)). Thus, with each output of the parallel to series converter representing plurality of bits in series as a successive samples are received, Bussgang et al. teaches inputting of first and second information sequences each comprising a sequence of a plurality of bits in series".

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3 Claims 19-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bussgang et al. (previously cited in Office Action 3/1/04).

Regarding claim 19, Bussgang et al. discloses a transmission apparatus comprising:

a converting section (Fig. 1, block 12, column 3, line 28-column 4, line 14) to which a first information sequence ($X_{01}, X_{02}, X_{03}, X_{04}$ etc...) comprising plurality of bits in series (see above response to arguments) and a second information sequence ($X_{61}, X_{62}, X_{63}, X_{64}$, etc...) comprising a plurality of bits in series (see above response to arguments) are input through different routes that generates a sequence of bits (output from block 13) including at least one bit of the first information and at least one bit of the second information (first and second bits of PCM sample) in which the first information sequence ($X_{01}, X_{02}, X_{03}, X_{04}$, etc...) is more important than the second information sequence (column 5, lines 24-37); and

a modulation section (Fig. 1, block 15, column 4, line 15-column 5, line 23) that modulates the sequence of bits to provide a transmission signal in such a way that one symbol is expressed using three or more bits,

wherein a bit corresponding to the first information sequence is arranged on at least the first bit of each symbol of the sequence of bits (column 5, lines 5-65).

Bussgang et al. does not explicitly disclose a modulation scheme which uses an orthogonal coordinate comprising an in-phase component and a quadrature component.

However, Bussgang et al. does disclose a phase modulator (column 4, line 15-column 5, line 23) using a phase modulation scheme in which one symbol is expressed using three or more bits. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made that this phase modulator could have implemented phase modulation schemes such as PSK in which one symbol is expressed using three or more bits on an orthogonal coordinate comprising an in-phase component and a quadrature component. Thus, since PSK is a type of phase modulation, claim 19 does not constitute patentability.

Regarding claim 20, which inherits the limitations of claim 19, Bussgang et al. does not disclose the first information sequence is important according to the level of importance for maintaining a normal connection. However, Bussgang et al. does disclose the first information sequence is the most significant information sequence in the PCM data sequences (column 4, lines 1-14). The bits in the first PCM data sequence ($X_{01}, X_{02}, X_{03}, X_{04}$) represents information used to process the remainder of the PCM data sequences at the receiver. Therefore, it would have been obvious to one skilled in the art that if this bit were damaged during transmission that it may effect the connection between a transmitter and receiver. Thus, claim 20 does not constitute patentability.

Regarding claim 21, which inherits the limitations of claim 19, Bussgang et al. does not disclose another bit corresponding to the first information sequence is arranged on the second bit

of each symbol of the transmission signal. However, it would have been obvious to one skilled in the art at the time the invention was made to arrange another bit of the first information (most important) on the second bit of each symbol since Bussgang et al. states that the first and second bit positions in the symbol afford the greatest protection from error (column 5, lines 20-23).

Regarding claim 22, which inherits the limitations of claim 21, Bussgang et al. discloses information to be arranged on one or both of the first bit and the second bit of each symbol of the transmission signal can be changed at any time according to the level of importance (column 5, lines 5-65), wherein the most important bits are placed in the first two bit positions (column 5, lines 57-65).

Regarding claim 23, which inherits the limitations of claim 23, Bussgang et al. discloses the first information is separated ($X_{01}, X_{02}, X_{03}, X_{04}$, etc...) from all information to be communicated and the second information ($X_{61}, X_{62}, X_{63}, X_{64}$, etc...) is other than the first information among all the information to be communicated (Fig. 1, block 12, column 5, lines 5-65).

Regarding claim 24, which inherits the limitations of claim 19, Bussgang et al. does not disclose a circuit that performs inverse Fourier transform processing on the modulated first information and second information. However, it is well known in the art that the inverse Fourier transform simply transforms frequency domain signals into time domain signals. It allows the user to operate in the time domain rather than the frequency domain. Thus, the choice of operating the frequency domain or the time domain is deemed a design choice and does not constitute patentability.

Regarding claim 25, which inherits the limitations of claim 19, Bussgang et al. discloses the base station apparatus transmits the transmission signal via an antenna (Fig. 1, element 16).

Regarding claim 26, which inherits the limitations of claim 19, Bussgang et al. discloses the communication terminal apparatus transmits the transmission signal via an antenna (Fig. 1, element 16).

Regarding claims 27-30, the claimed method includes features corresponding to subject matter mentioned in the above rejection of claims 19-22.

Conclusion

4. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Curtis B. Odom whose telephone number is 571-272-3046. The examiner can normally be reached on Monday- Friday, 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 571-272-3056. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Curtis Odom
September 21, 2005

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